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(54) Title: METHOD FOR EXTRACTING FOOD OIL FROM SEEDS AND/OR OILY FRUITS AND PRODUCT OBTAINED THEREFROM

(57) Abstract

A method for extracting food oil from seeds and/or oily fruits, the method comprising the steps of: crushing the cells of the starting material and crumbling a charge of maize, mixing with each other the crushed yields, arranging a filtering vegetable mass of grains of maize having a predetermined grain size, arranging one layer upon the other the mixture of crushed yields and the filtering grains of maize in a high-efficiency press, hard-pressing said layers so as to provide about 90% of the oil contained in the starting material and a solid pressing residual.

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METHOD FOR EXTRACTING FOOD OIL FROM SEEDS AND/OR OILY FRUITS AND PRODUCT OBTAINED THEREFROM

DESCRIPTION

This invention relates to a method for extracting food oil from seeds and/or oily fruits. Food oil obtained by said method is also an object of this invention.

It is universally acknowledged that lipids are very important in the human nourishment, especially considering the well-known superiority of the vegetable oils from dietetic and metabolic point of view with respect to animal grease. This has involved a considerable development of almost industrial techniques for extracting oil from seeds and/or oily fruits which have supported the traditional production of olive oil.

The above mentioned industrial methods, even if they are different to a certain extent as far as the treatments and the equipment are concerned, typically require the use of solvents (for example exane) and high temperatures in the order of 180-200°C. This causes a series of drawbacks. The final products is a colourless, scentless oil having no taste. Eventual traces of solvent, which has been technologically separated or eliminated, can affect the organoleptic characteristics and the digestibility as well as in prospect the innocuity of the product thrown on the market, even if said traces are not sensed by the palate of consumers. Moreover, because of the high temperatures reached above all in the destillation and deacidification process the processing residual cannot in any way be used neither in the

zootechny, as protein components of said residual are baked, lipids are wasted and the row fiber is reduced to a powder. Consequently, the commercial value of the residual is practically null and the use thereof is limited to the function of filler or inert material in some industry.

An object of this invention is to avoid the above mentioned drawbacks by a method allowing oil to be extracted from seeds and/or oily fruits without using solvents and colouring agents while operating about at room temperature (in the order of 30°C), said oil being genuine and palatable and the processing residual being used as food for animals.

According to the invention it is provided a method comprising following steps: crushing the cells of the starting material and separately crumbling a charge of maize or Indian corn at a predetermined grain size; mixing with each other both crushed yields; arranging one layer upon the other the mixture of crushed yields and suitably crumbled, selected grains of maize in a press; hard-pressing said layers so as to provide about 90% of the oil contained in the starting material and a solid pressing residual.

Still according to the invention said layers of crumbled, selected grains of maize, which are inserted between layers of the mixture of crushed starting material and crumbled charge of maize, have about half the thickness of the crushed mixture and act as draining and filtering member.

In this description as well as in the claims the term "starting material" indicates the oily seed from which oil has to be extracted, for example

sunflower, soya-bean, colza, sesame, peanut, almond a.s.o. or an oily fruit such as olive or avocado. Of course, said seeds or fruits can be either used alone or in a mixture with each other.

EXAMPLE

A certain amount of the starting material, for example sunflower seeds, is cleaned by ventilation, then cold-milled by a cellular crusher which has been patented by the same Applicant. Said crusher has the function of providing a crushed yield with open cells so that said crushed yield is under optimum condition of giving the maximum quantity of oil contained therein.

Apart from said crusher another crusher similar to the former but being able to be adjusted mills a quantity of dry maize equal to 12% of the charge of sunflower seeds so as to provide grains having a size of about 2,5 mm with 25% of crushed yield.

The crushed yields of sunflower and maize seeds are brought at the same time in a mixing and drying tank having a hollow space at the bottom at a temperature not higher than 35°C. Temperature of crushed yield, however, should not be higher than 30°C and the humidity should not be higher than 10%. This step has the function of making fluid the oil of the crushed yield and assuring that the residual humidity ranges in an acceptable field.

Afterwards, an arrangement in layers is provided so that an alternate succession of layers of the mixture consisting of crushed yields of sunflower and maize from the mixing tank and ventilated grains

of maize which are suitably selected is arranged in a press till a charge of about 50 kg of mixed crushed yield and 50 kg of ventilated grains of maize is provided. The thickness of the layers is about 2 cm as for the crushed yield and about 1 cm as for the grains of maize.

All layers are brought in a coaxial bicylindrical press squeezing the layers in about 10 minutes till a very high specific pressure in the order of about 600 kg/cm^2 is reached, thus extracting about 90% of the oil contained in the seeds. Oil is conveyed to a centrifugal cleaner operating with cold, drinkable water (at a temperature of about 30°C) said cleaner supplying very clean oil without any deterioration or change of colour. After about 6 days of decantation oil becomes very limpid and does not need any filtering. Sediment of the centrifugal cleaner has the form of a sticky, putrescent, water-soluble, biodegradable mass. Its amount is equal to about 1% of the total.

Pressing residual is conveyed to a pneumatic selecting-breaking up machine which recovers the grains of maize (about 90% of the initial amount) and recycles them into the press thereby forming layers, and the pressed yield is conveyed to the store. Said recoverd grains of maize are integrated by 10% of fresh milled maize as mentioned above.

The pressed yield consisting of maize or Indian corn and sunflower in the ratio of 1:10 comprises after being analyzed about 25% of proteins, about 8-10% of lipids and about 50% of row fiber so that it can be used as an optimum food for animals.

From what above it is self-evident that the main teaching of this invention is to provide a set of natural, genuine "filters" consisting of layers of grains of maize and crumbled grains of maize mixed with the material to be squeezed which has not only the function of draining and filtering agent but also gives the oil the organoleptic characteristics of maize, so that limpid, slightly coloured oil of palatable taste is provided, and further acts above all as anti-oxidizer. Thus the use of solvents, filters, dying agents and preservative chemicals that besides increasing the cost of manufacturing do not give any warranty of innocuity is avoided.

All main operative steps of the method of this invention, i.e. crushing, arranging in layers, pressing, centrifugal sedimentation and breaking up, are carried out by machines patented by the same Applicant.

CLAIMS

1. Method for extracting food oil from seeds and/or oily fruits, characterized in that it consists of following steps: crushing the cells of the starting material and separately crumbling a charge of maize; mixing with each other the crushed yields; arranging a filtering mass of grains of maize having a predetermined grain size; arranging one layer upon the other the mixture of crushed yields and the filtering grains of maize in a press; hard-pressing said layers so as to provide about 90% of the oil contained in the starting material and a solid pressing residual.

2. The method of claim 1, characterized in that said filtering vegetable mass consists of dry, clean milled maize having a grain size of about 2,5 mm.

3. The method of claims 1 and 2, characterized in that the filtering layers have about half the thickness of the layers of crushed yields.

4. The method of claims 1 to 3, characterized in that before crushed yields and grains of maize being arranged in layers they are separately treated in a mixing tank with water bath which is maintained at 30°C by a thermostat with humidity not greater than 10%.

5. The method of claims 1 to 4, characterized in that the pressing step is carried out in about 10 minutes at the specific pressure of about 600 kg/cm^2.

6. The method of claims 1 to 5, characterized in that oil from the press is subjected to centrifugal

sedimentation, and the solid residual is conveyed to a pneumatic selecting-breaking up machine recovering the grains of maize and recycling them to the step in which they are arranged in layers, the residual crushed yield being stored to be used as food for animals.

7. The method of claims 1 to 6, characterized in that the starting material consists of oily seeds such as sunflower, soya-bean, colza, sesame, peanut, almond and the like, alone or mixed with one another, or oily fruits such as olive or avocado.

8. Edible, fully vegetable oil provided by the method of claims 1 to 7.

9. Method for extracting food oil from seeds and/or oily fruits according to claims 1 to 7, essentially as described.